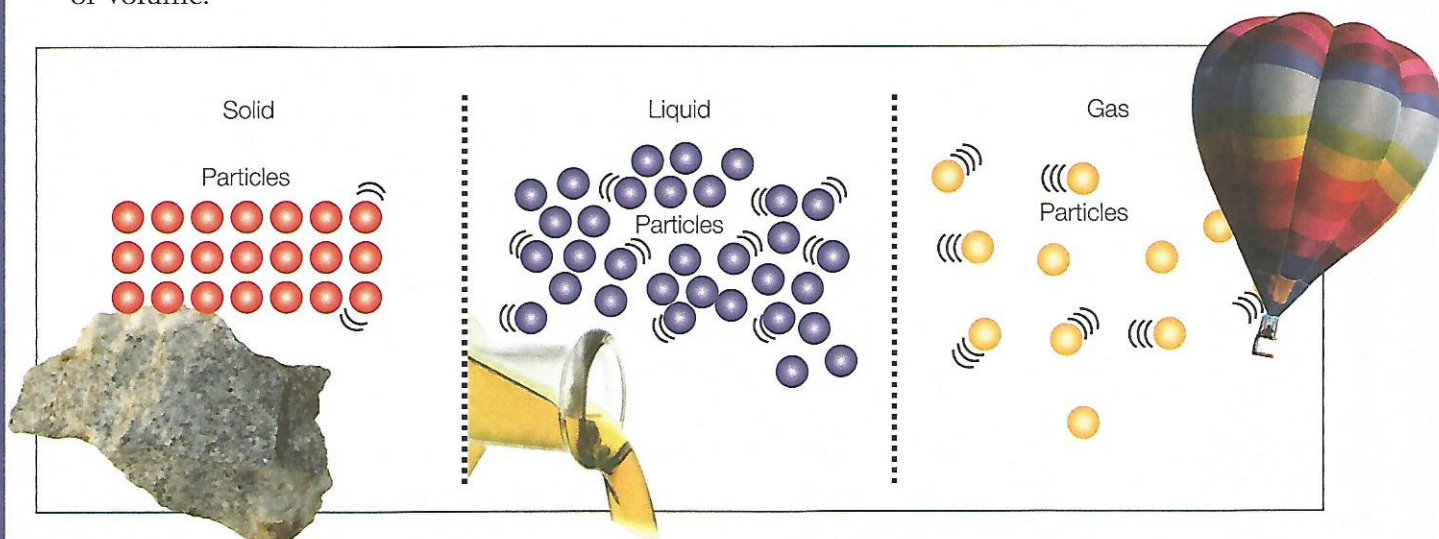


The states of matter

The main states of matter are solid, liquid and gas. The state in which we find matter depends on the **temperature** and **pressure**.

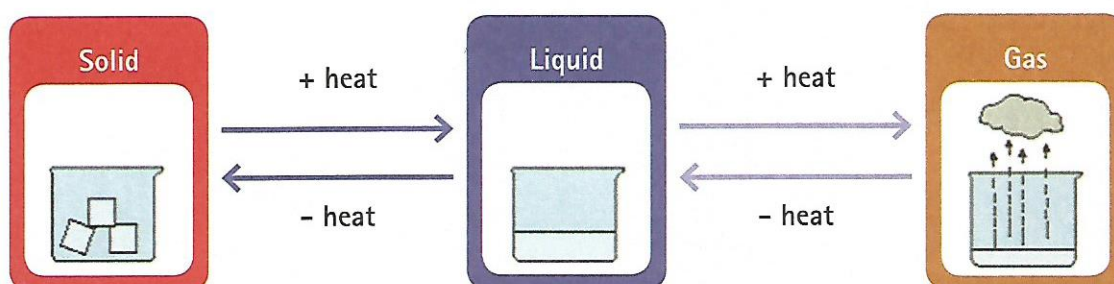
- **Solid:** the particles which make up the matter have hardly any freedom of movement. They are very close to each other and the bonds between them are very strong. This is why a solid retains its shape and its volume.
- **Liquid:** the particles which make up the matter are close together but have more freedom than in a solid state because the bonds between them are weaker. Liquid does not have a definite shape but takes the shape of its containers, although its volume is constant.
- **Gas:** the particles have great freedom of movement. The distance between the particles is variable and the bonds are very weak. As a result, matter in a gaseous state does not have a constant shape or volume.



Changes of state

When we give a solid body enough heat it can reach its **melting point**: at this point the particles separate and the solid body changes into a liquid. If we continue to heat the liquid it reaches its boiling point and changes into a gas.

- **Melting** is when a solid turns into a liquid. **Solidification** or **fusion** is the reverse transformation, when a liquid turns into a solid.
- **Vaporisation** is when a liquid turns into a gas, if the transformation happens by heating the liquid to its **boiling point**. If the transformation is produced below a liquid's boiling point, we call it **evaporation**.
- **Condensation** is the transformation of a gas into a liquid.
- **Sublimation** is when a solid turns into a gas without passing through the liquid state. The reverse process, when a gas turns into a solid without passing through a liquid state, is **inverse sublimation** or **deposition**.

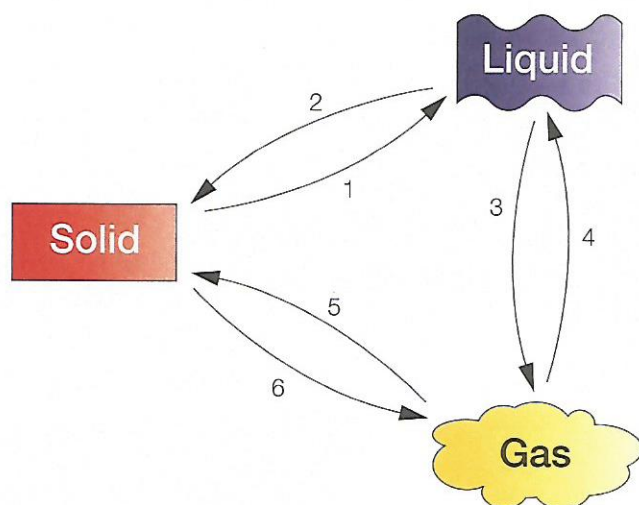


• **Activity 1. Complete the phrases with the following words.**

gaseous • liquid • constant • freedom • close • containers • volume • shape

- 1 The solid state has a definite _____ and a constant _____. The particles are very _____ together.
- 2 In the _____ state, the particles which make up the matter have great _____ of movement.
- 3 Liquids do not have a constant shape. They take the shape of their _____.
- 4 Gases do not have a _____ shape or volume.
- 5 In the _____ state, the links between particles are weaker than in the solid state but the volume is constant.

• **Activity 2. Complete the diagram by naming the changes of state.**



- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____
- 6 _____

• **Activity 3. True or false? Rewrite the false sentences correctly.**

- | | True | False |
|--|--------------------------|--------------------------|
| 1 The change from the solid state to the liquid state is called solidification. | <input type="checkbox"/> | <input type="checkbox"/> |
| <hr/> | | |
| 2 In a solid, the links between particles are weak. | <input type="checkbox"/> | <input type="checkbox"/> |
| <hr/> | | |
| 3 If a gas cools, it condenses. | <input type="checkbox"/> | <input type="checkbox"/> |
| <hr/> | | |
| 4 In the gaseous state, matter does not have a constant shape but its volume stays the same. | <input type="checkbox"/> | <input type="checkbox"/> |
| <hr/> | | |

• **Activity 4. Write examples that you can find at home.**

- 1 Evaporation: _____
- 2 Solidification: _____
- 3 Melting: _____
- 4 Condensation: _____